ISIP017US

SPECIFICATION AMENDMENTS

Please replace the abstract with the following amended abstract:

Abstract

A device, system and method for detecting and measuring concentrations of elements in fluids comprises: flowing a fluid through a central flow interelectrode gap of an ionic preconcentration cell separating an upper high specific surface area electrode from a lower high specific surface area electrode of the ionic preconcentration cell by a predetermined interelectrode gap width; and applying a voltage differential between the upper high surface area electrode and the lower high surface area electrode while the fluid is flowing through the central flow interelectrode gap. As such, this cell that utilizes its inherent capacitance for double layer formation to extract ultra-trace levels of ionic contaminants from fluids ~~aqueous solutions~~ in order to enhance detection by x-ray fluorescence analysis. ~~Concentration enhancement is achieved by capturing solute ions from the bulk concentration onto the thin double layer required to support an applied voltage. The concentration of these ions is increased by several orders of magnitude due to the migration of the ions from the solution onto the double layer. The automated features of this analysis system and the unique operation of the pre-concentration device allow for in-situ operation remote operation and eliminate the need for highly trained operators.~~

Please replace paragraph 85 with the following amended

paragraph:

[0085] It is also to be noted that the various window properties discussed above are optional for the "lower" window, insofar as it is possible to simply seal the "lower" face of the preconcentration cell with any material that provides a suitable fluid barrier and will not degrade under x-ray exposure or contact with the fluid of interest. The x-ray scattering and transmission properties of the lower face of the cell ~~cell~~ are of much less importance than those of the "upper" window since it is the upper window through which the x-rays are transmitted and XRF readings are taken.

Please replace paragraph 91 with the following amended paragraph:

[0091] The present invention utilizes as x-ray source means *644*~~444~~, preferably, but without limitation, a Kevex model 5039S X-ray source which generates up to 50 keV electrons at 1.0 mA. The resulting Bremstrahlung radiation from a tungsten target generates the primary x-ray beam from the source. The input x-ray flux must have sufficient energy and intensity to excite the metal ions captured in the pre-concentration cell *100* to fluoresce in order for detection to take place. Alternatively, the present invention could also utilize as x-ray source means *644* , a sealed x-ray source, obtainable from vendors such as Isotope Sciences of Canoga Park, California. The advantage of sealed sources is that they do not require power inputs from external sources. Similarly, any other type of x-ray source means *644* known in the art or which may become known in the art, which

meets the functional requirements specified herein, is also suitable for use within the scope of this disclosure and its associated claims.

Please replace paragraph 73 with the following amended paragraph:

[0073] The specific properties of this NCC electrode material which make it suitable for this application include a large plurality of pores characterized by a specific surface area of at least approximately 100 $m^{2/3}/g$; an average pore diameter of said pores between approximately 30 nm and 10 nm per pore; a distribution of pore diameters grouped with a standard deviation of less than approximately 10 nm around the average pore diameter; an x-ray transparency greater than approximately 90% for characteristic photon energies from an element of interest for which a fluidic concentration is to be measured by said system; electrical conductivity of 10-40 mOhms-cm when fabricated into a ¼ mm thick electrode; the ability to contain approximately at least 0.1% by weight of foreign material relative to the high surface area material prior to saturation; high structural rigidity wherein a displacement under the flow of the fluid does not exceed approximately 0.25mm; high wetting ability wherein an approximately ¼ mm thick sheet of the high surface area material becomes substantially wetted in less than approximately three seconds; and freedom from metallic impurities in excess of approximately .5 parts per million, when measured by XRF analysis. In order to achieve satisfactory performance, the use of any alternative or substitute material for the upper and lower

high surface area electrodes *218* and *220* possessing similar properties to those outlined above is regarded to be within the scope of this disclosure and its associated claims.

Please change to *title of the invention* to read as follows:

"Ionic Pre-concentration XRF Identification ~~Detection~~ and Analysis Device, System and Method"